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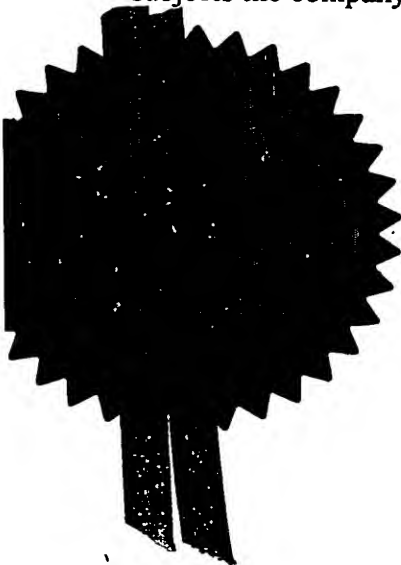
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(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1. Your reference

P35091-/CAM/MEA

2. Patent application number  
(The Patent Office will fill in this part)

0321970.6

19 SEP 2003

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Sepna Limited  
Jubilee Road  
Newtownards  
BT23 4XQ  
Northern Ireland

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

8239166002  
United Kingdom

4. Title of the invention

Deblistering Apparatus

5. Name of your agent (if you have one)

Murgitroyd &amp; Company

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Scotland House  
165-169 Scotland Street  
Glasgow  
G5 8PL

Patents ADP number (if you know it)

1198015

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)Date of filing  
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if

Yes

- a) any applicant named in part 3 is not an inventor, or  
b) there is an inventor who is not named as an applicant, or  
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Continuation sheets of this form

Description 11

Claim(s) -

Abstract -

Drawing(s) 3 + 3 *Mc*

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Priority documents -

Translations of priority documents -

Statement of inventorship and right to grant of a patent (Parents Form 7/77) -

Request for preliminary examination and search (Parents Form 9/77) -

Request for substantive examination (Parents Form 10/77) -

Any other documents (please specify) -

11.

I/We request the grant of a patent on the basis of this application.

Signature *Murgitroyd & Co.*  
Murgitroyd & Company

Date  
19 September 2003

12. Name and daytime telephone number of person to contact in the United Kingdom

Mark Earnshaw

02890 320441

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1     "Deblistering Apparatus"

2

3     The present invention relates to deblistering  
4     apparatus and a deblistering process.

5

6     Pharmaceutical tablets and the like are frequently  
7     sold in 'blister packs'. Blister packs are designed  
8     to provide a number of tablets or the like together,  
9     and are generally formed by having a number of  
10    blisters, one for each tablet or the like, and some  
11    form of substantially flat 'lid'. Increasingly, the  
12    lid includes some form of metal 'foil', so as to (a)  
13    increase the child-resistance of such packs being  
14    openable, and (b) to provide a better seal over the  
15    blisters to prevent as far as possible contamination  
16    of the tablet and the atmosphere in the blisters  
17    prior to use.

18

19    For various reasons, such as for instance incorrect  
20    filling, wrong batch labelling or specific  
21    formulation requirements, it is desired to deblister  
22    the tablets from the pack, especially where the

1 tablets are valuable and can be reused.  
2 Deblistering of tablets from a 'push-through'  
3 blister pack is generally carried out by passing the  
4 packs through rollers. For the more sealed nature  
5 of child-resistant packs, deblistering of tablets  
6 from such packs requires cutting of the foil lid  
7 prior to pushing out the tablet from the blister.  
8

9 The generality of this operation is shown in  
10 US4428709. However, the machinery shown in  
11 US4428709 only relates to individual cutting and  
12 punching along a strip of blister packages in ribbon  
13 form. Our WO 00/27709 describes a rotary  
14 deblistering apparatus, whereby blister packs in  
15 their more usual form can be automatically loaded  
16 onto a rotary drum, and the cutting and deblistering  
17 carried out at separate stations as the drum rotates  
18 to accommodate further blister packs in an automatic  
19 operation.  
20

21 However, it is often desired to be able to extract  
22 the contents of a single blister pack. This does  
23 not require the more sophisticated machinery shown  
24 in WO 00/27709. Moreover, it is often desired to be  
25 able to use the same machinery to extract the  
26 tablets from different patterns, sizes and shapes of  
27 blister packs.  
28

29 It is an object of the present invention to provide  
30 a simple but effective apparatus and process adapted  
31 to provide quick and efficient single blister pack  
32 extraction.

1 According to one embodiment of the present  
2 invention, there is provided apparatus for  
3 deblistering a pharmaceutical blister pack having a  
4 number of product blisters and a lidding material  
5 thereover, the apparatus comprising a pack holding  
6 means adapted to hold the blister pack and means to  
7 transfer the pack into and out of alignment with an  
8 operating position, the operating position having a  
9 lidding material cutting means and a blister  
10 punching means on opposing sides thereof.

11  
12 The lidding material is generally in the form of a  
13 foil, often including one or more layers of metallic  
14 material. The lidding material creates a 'lidded'  
15 or 'sealed' or 'closed' arrangement with the  
16 blisters.

17  
18 The pack holding means is preferably adapted to  
19 match the configuration of the design of the pack to  
20 be deblistered. More preferably, the pack holding  
21 means has a series of complementary indentations or  
22 holes corresponding to the blisters of the pack to  
23 be deblistered. The holes could extend through the  
24 pack holding means to its other face.

25  
26 The pack holding means preferably retains the  
27 blister pack either through position, friction or  
28 additional retaining or restraining means until the  
29 empty blister pack is ready to be discarded. Such  
30 retaining or restraining means includes any  
31 pneumatic or mechanical arrangement, such as an over  
32 plate.

1 In one embodiment of the present invention, the pack  
2 holding means is retained by a plate transfer means,  
3 which transfer means is adapted to provide the  
4 movement of the pack holding means into and out of  
5 alignment of the operating position. The transfer  
6 means could comprise any form of mechanical  
7 arrangement, preferably including means to confirm  
8 the alignment of the pack holding means into and out  
9 of the operating position. Such means includes  
10 guide rails and pins and the like, and the transfer  
11 means may be an arm or a piston or the like having  
12 reciprocal motion.

13  
14 In another embodiment of the present invention, the  
15 pack holding means is adapted to rotate when out of  
16 alignment with the operating position. Preferably,  
17 the rotation is provided by rotation of the transfer  
18 means along its axis of movement. Rotation of the  
19 pack transfer means allows its position to be  
20 adapted to suit the user, and/or loading and/or  
21 unloading of the blister pack.

22  
23 The lidding material cutting means generally  
24 comprises a number of cutting pieces such as studs  
25 having means to cut through lidding material at the  
26 operational end of each piece. The pieces may be  
27 attached to a general carrier plate so as to be  
28 simultaneously operable. The pieces are preferably  
29 arranged in a pattern which is complementary to the  
30 position of the blisters on the pack to be  
31 deblistered. Preferably, the cutting means is  
32 changeable. The cutting means may be changeable by

5

1 the introduction of different patterned cutting  
2 plates the different blister arrangements, or by re-  
3 patterning of the pieces on a general carrier plate.

4  
5 The cutting means is moveable between a rest  
6 position and a cutting position, which cutting  
7 position involves the engagement of the cutting  
8 means with the blister pack so as to wholly,  
9 substantially or partly weaken or break through the  
10 lidding material of the blister pack around each  
11 blister as is known in the art.

12  
13 The blister punching means comprises any known means  
14 adapted to pressure the blisters of the blister pack  
15 so as to force the contents of the blisters through  
16 or past the lidding material. Generally, the  
17 contents of the blisters will be collectable. The  
18 punching means may comprise separate elements  
19 adapted to individually punch each blister, or a  
20 more general punch adapted to act directly or  
21 indirectly on all blisters simultaneously. The  
22 latter arrangement has the advantage of not  
23 requiring changeability to act on different blister-  
24 patterned blister packs.

25  
26 The punching means may act directly or indirectly on  
27 the blisters. The pack holding means may include  
28 means to engage the blisters, which engagement is  
29 controlled by the punching means.

30  
31 In another embodiment of the present invention, the  
32 blister pack is wholly or substantially in a



6

1 vertical position in the operating position, such  
2 that the contents of the blisters will fall away  
3 from the blister pack due to gravity once  
4 deblistered.

5  
6 According to second aspect of the present invention,  
7 there is provided a method of deblistering a  
8 pharmaceutical blister pack having a number of  
9 product blisters covered by a lidding material,  
10 comprising the steps of:

11  
12 locating the blister pack on a pack holding means  
13 having complementary pockets corresponding to the  
14 blisters of the blister pack;  
15  
16 transferring the pack holding means into an  
17 operating position in alignment with a lidding  
18 material cutting means and a blister punching means,  
19  
20 wholly, substantially or partly cutting the lidding  
21 material by activation of the cutting means,  
22  
23 deblistering the contents of the product blisters by  
24 engagement of the blister punching means such that  
25 the contents are without the blister pack, and  
26  
27 moving the deblistered blister pack out of alignment  
28 with the operating position.

29  
30 An embodiment of the present invention will now be  
31 described by way of example only and with reference  
32 to the accompanying diagrammatic drawings in which:

1 Figure 1 is a schematic perspective view of  
2 apparatus according to one aspect of the present  
3 invention;

4  
5 Figure 2 is a second schematic perspective view of  
6 the apparatus of Figure 1 with the pack holding  
7 means out of alignment with the operating position;

8  
9 Figures 3a-3d are a series of schematic side views  
10 of the cutting and punching operations of the  
11 apparatus of Figure 1; and

12  
13 Figures 4a-4c are plan and two side view of the pack  
14 holding means shown in Figure 1.

15  
16 Referring to the drawings, Figure 1 shows very  
17 schematically the principle of the present  
18 invention.

19  
20 The present invention provides a single cutting and  
21 punching station for a pharmaceutical blister pack.  
22 These operations can be carried out whilst the  
23 blister pack is stationary, and so in alignment with  
24 the means for cutting and punching. This provides  
25 simplicity of arrangement of the features of the  
26 invention, and the minimal number of moving parts to  
27 effect deblistering of the blister pack.

28  
29 In Figure 1, there is schematically shown a lidding  
30 material cutting means 4 and a blister punching  
31 control means 6 on opposing sides of a transfer  
32 plate 2 having a pack holding means 10 therewithin.

8

1 The pack holding means 10 is in an operating  
2 position between the cutting means 4 and the  
3 punching means 6, and is moveable by a ram 8 out of  
4 this operating position alignment.

5  
6 Figure 2 shows the pack holding means 10 out of  
7 alignment by movement of the ram 8 and transfer  
8 plate 2, and also rotation of the pack holding means  
9 10 into a horizontal position as explained  
10 hereinafter.

11  
12 Figures 4a-4c show a pack holding means 10 in  
13 detail. The pack holding means 10 is similar to  
14 that shown in our WO 00/27709, the features of which  
15 are incorporated herein by way of reference.  
16 Generally, the pack holding means comprises a top  
17 plate 14 having a series of apertures 12 therein,  
18 the apertures 12 being patterned to be complementary  
19 to the shape of the blister pack to be deblistered.  
20 The apparatus of the present invention could be  
21 provided with different pack holding means for  
22 different patterned blister packs, or different top  
23 plates.

24  
25 Across the top of the top plate 14 is a blister pack  
26 retainer frame 16 hinged along one side of the top  
27 plate 14. The frame 16 is rotatable away from the  
28 top plate 14 during loading or unloading of the  
29 blister pack with the pack loading means 10, and  
30 then rotatable down on top of the blister pack so as  
31 to securely and firmly retain the blister pack  
32 against the top plate 14 during use.

1 Attached to the top plate 14 via a shoulder bolt 18  
2 is a bottom plate 20 biased away from the top plate  
3 14 by two intermediate springs 22. Upstanding from  
4 the bottom plate 20 are a series of eject pins 24  
5 aligned with the pockets 12. The pins 24 are fixed  
6 to the bottom plate 20 by holding screws 26.

7  
8 Preferably, the pack holding means 10 is located  
9 within the transfer plate 2 attached to the arm 8 by  
10 press fitting or a simple catch mechanism, such that  
11 the pack holding means 10 can quickly and easily be  
12 changed for different patterned blister packs.

13  
14 In use, a blister pack, having in this example ten  
15 blisters in an arrangement of five X two, is located  
16 on the pack holding means 10, and the frame 16  
17 located over the blister pack in order to retain it  
18 firmly against the top plate 14.

19  
20 Preferably, the pack holding means 10 is in its  
21 horizontal position as shown in Figure 2, so as to  
22 make it easier for the user to locate the blister  
23 pack on the pack holding means 10, both visually and  
24 physically. The pack holding means 10 can then be  
25 rotated through 90°C by rotating the arm 8, so that  
26 the pack holding means 10 is wholly or substantially  
27 in the same plane as the cutting means 4 and  
28 punching means 6.

29  
30 The pack holding means 10 is then transferred into a  
31 operating position by the arm 8 between the opposing

10

1 cutting means 4 and punching means 6 as shown in  
2 Figure 1.

3

4 Turning to Figures 3a-3d, Figures 3a-3b show  
5 movement of cutting means 4 towards to blister pack  
6 30. The cutting means 4 comprises a plate 32 having  
7 a series of studs 34 thereon, the distal ends of the  
8 studs 34 having serrated edges in order to effect  
9 weakening and/or complete cutting through the  
10 lidding material of the blister pack 30 as shown in  
11 Figure 3b.

12

13 Figure 3c shows retraction of the cutting means 4.

14

15 Figure 3d shows impact of the punching control means  
16 6 on the pack holding means 10. The punching means  
17 6 need only be a ram, arm or piston means able to  
18 pressurise the base plate 20 as shown in Figure 3d.  
19 Impacting the base of the bottom plate 20 forces it  
20 towards the top plate 14, such that the pins 24  
21 travel through the pockets of the blister pack 30  
22 and mechanically push out the contents from the  
23 blisters and allow them to fall away from the  
24 blister pack 30. This arrangement provides an even  
25 force of ejection across all the blisters.

26

27 The ejected contents of the blister pack will fall  
28 by gravity beneath the operating position, and can  
29 be collected by a convenient receptacle for use or  
30 repackaging.

31

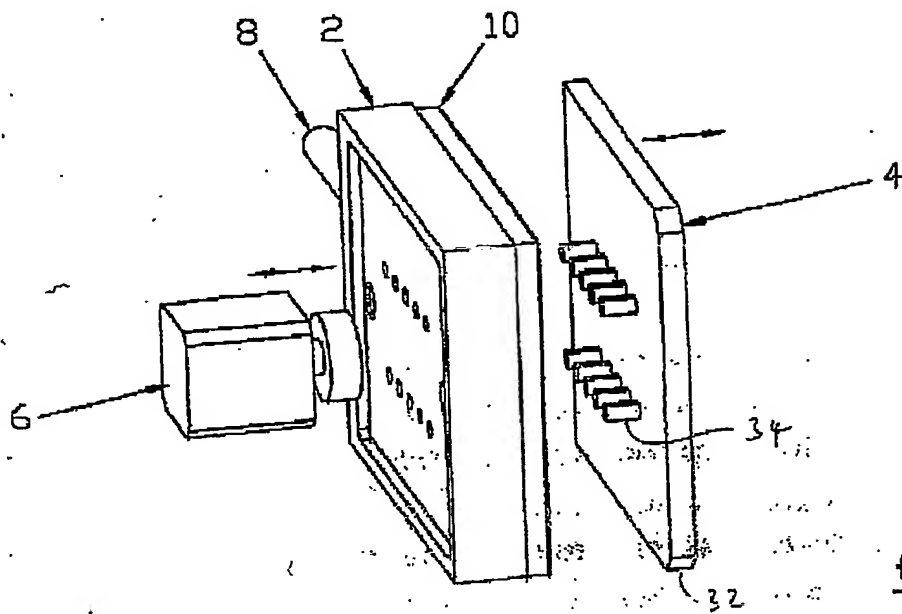
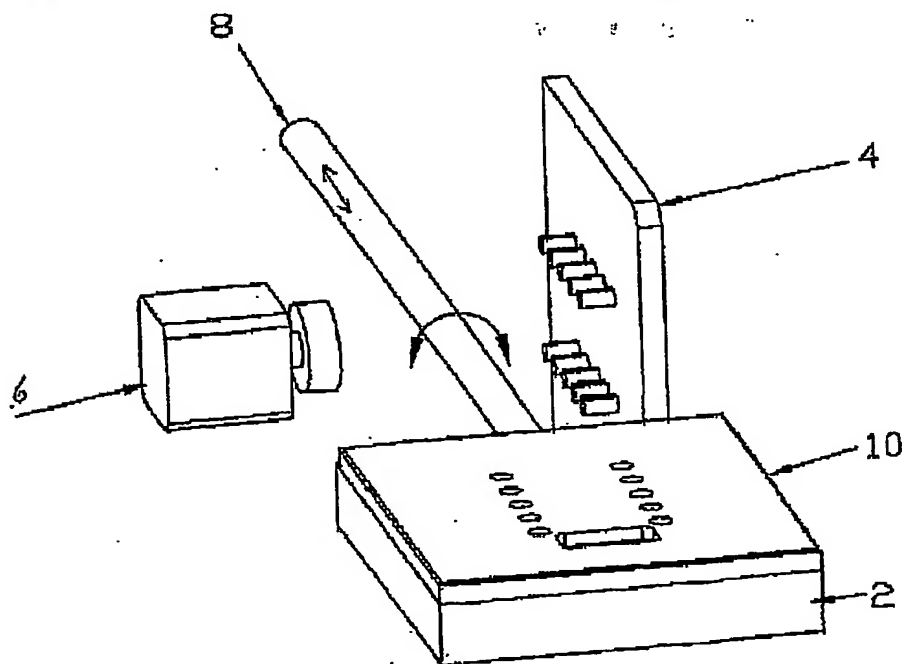
11

1 Meanwhile, the pack holding means 10 is moved from  
2 the operating position between the cutting means 4  
3 and the punching means 6 by operation of the ram 8.

4  
5 The restraining frame 16 is then manually, or  
6 preferably automatically, moved away from the top  
7 plate 14, such that the deblistered blister pack can  
8 fall away from or be taken away from the pack  
9 holding means 10 to allow a new blister pack to be  
10 loaded. Where the pack holding means 10 is in a  
11 vertical position and the restraining frame 16 is  
12 moved away, the deblistered blister pack may  
13 inherently fall away from the pack holding means.

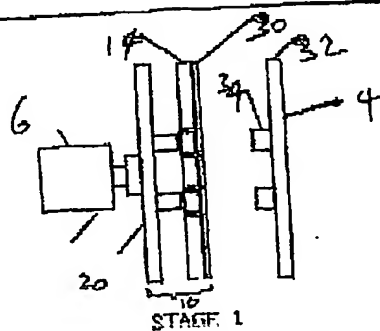
14  
15 The present invention provides a simple apparatus  
16 having few moving parts for deblistering of a  
17 blister pack. Only the pack holding means requires  
18 significant movement into and out of alignment with  
19 the cutting means and punching means, each of which  
20 requires little movement in themselves to provide  
21 their effect.

1/3

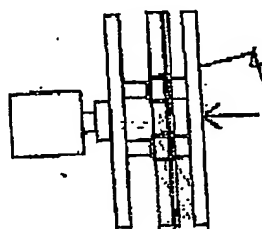
fig. 1fig. 2

2/3

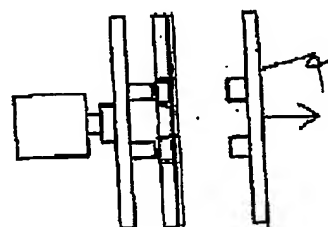
Fig 3a



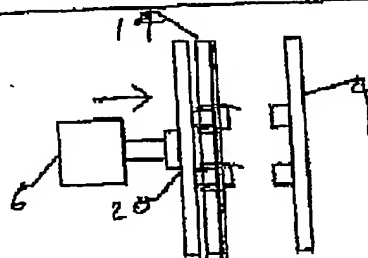
3b



3c



3d





3/3

fig. 4b

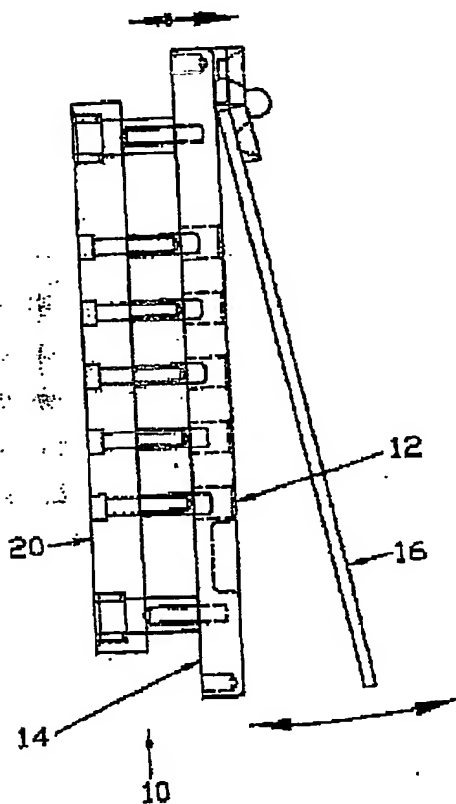


fig. 4a

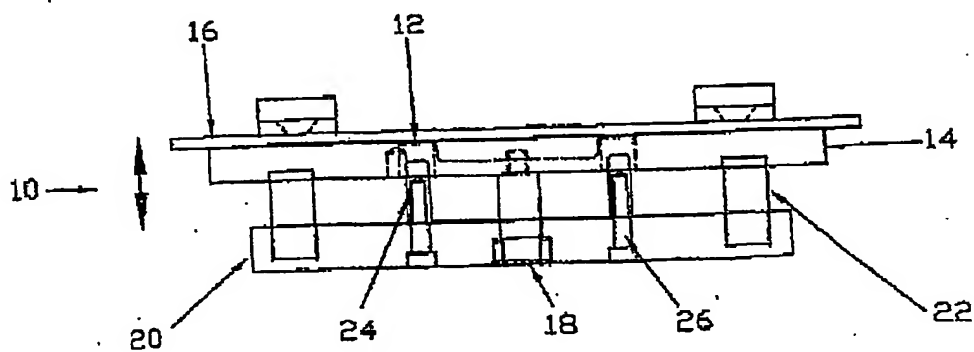
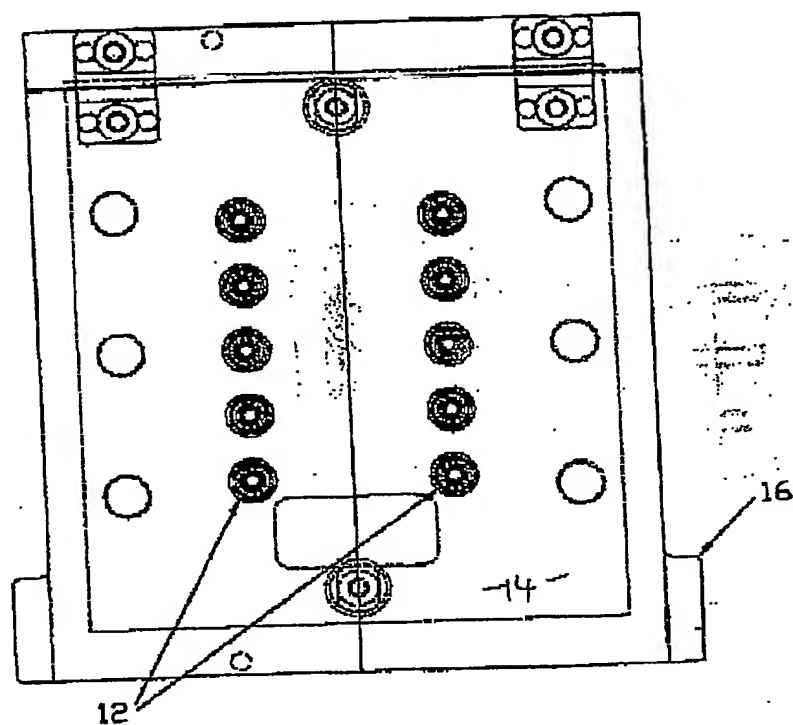


fig. 4c

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